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(21) International Application Number: PCT/IT96/00151 (22) International Filing Date: 24 July 1996 (24.07.96) (30) Priority Data: RM95A000521 27 July 1995 (27.07.95) IT (71) Applicant (for all designated States except US): TELECOM ITALIA MOBILE S.P.A. [IT/IT]; Via Bertola, 34, I-10122 Torino (IT). (72) Inventor; and (75) Inventor/Applicant (for US only): SENTINELLI, Mauro [IT/IT]; Via Luigi Rizzo, 22, I-00136 Roma (IT). (74) Agents: DOMENIGHETTI FIAMMENGHI, Delfina et al.; Fiammenghi Fiammenghi, Via Quattro Fontane, 31, I-00184 Roma (IT).		(81) Designated States: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i>
(54) Title: RADIO MOBILE TERMINAL PROVIDED WITH AN ADDITIONAL READER OF CHIP CARDS (57) Abstract Radio mobile terminal provided with an additional chip card reader of prepaid chip cards, which can be made available both on a terminal realized according to the TACS technology and on a terminal employing the GSM technology. The prepaid chip card embodies the payment means for the radio mobile telephony service.		

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Description

Radio mobile terminal provided with an additional
reader of chip cards

Technical field

The present invention relates to a radio mobile terminal provided with an additional reader of chip cards, and more particularly it relates to a radio mobile terminal provided with an additional reader of prepaid chip cards, which can be implemented both on terminals realized with the TACS (Total Access Communication System) technology, and on terminals employing the GSM (Global System for mobile communication) technology.

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Background Art

Presently, both the TACS service of mobile telephony and the GSM telephone service do not provide prepaid chip cards, notwithstanding their wide diffusion. On the other hand, the advantages of telephonic prepaid cards are well known in public telephony, since they allow their user to continuously check the amount of the credit and expense.

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Disclosure of Invention

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An object of the present invention is to realize a radio mobile terminal provided with an additional reader of chip cards, which allows to increase the functionality of the terminal, permitting the

utilization of prepaid cards for paying the radio mobile service, when benefiting by this service.

A further object of the present invention is to provide a radio mobile terminal with an additional reader of chip cards, wherein the additional reader is compatible with the prepaid chip cards issued by the administrator of this service and can manage the various operations (validation, obliteration, card change, etc.).

At last another object of the invention is to realize a radio mobile terminal provided with an additional chip card reader, being completely consistent with the presently employed construction technologies in the field of mobile telephony and being easy to handle by the final user.

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Best Mode of Carrying out the Invention

The above and other objects which will be clearly illustrated in the course of this description, will be attained by a radio mobile terminal provided with an additional reader of chip cards, wherein an additional reading device (a second reader corresponding to a standard format in the case of terminals of the GSM type) manages a prepaid chip card which stores the amount of the available credit used for benefitting by the telephone service; said chip card embodies the payment means for the radio mobile service. The additional reader of chip cards complies with the ISO 7816-2 standard and the ID1 format, and it can read

cards with six contacts as well as with eight contacts. The radio mobile terminal being compatible with the network standard, is provided with all functions of the network, and it is additionally equipped with the

5 functions related to the management of chip cards. In the terminals of the GSM type the additional reader must also be realized so as to be able to read identification cards for mobile communication (SIM) (SIM = Subscriber Identity Module) having a format ID-1.

10 In this case, the possible operative conditions of the terminal comprising two chip card readers are the following:

- if the SIM card is inserted in the usual (ordinary) reader and no card is inserted (loaded) in the
- 15 additional reader ID-1, the terminal of the type GSM manages the SIM card of the ordinary reader;
- if two SIM cards are loaded, the SIM card of the ordinary reader and the SIM card of the additional reader ID-1, the GSM terminal manages the SIM card of
- 20 the additional reader ID-1 only;
- if the ordinary or usual reader is not loaded and only the additional reader ID-1 is loaded, the GSM terminal manages the SIM card of the additional reader ID-1;
- if the ordinary reader is loaded and the prepaid card
- 25 is loaded inside the additional reader, the GSM terminal manages the SIM card of the ordinary reader; the payment is carried out by means of the prepaid card inserted into the additional reader.

The additional reader of the terminal can also perform the following functions:

- it allows insertion and removal of the chip card, automatically and simply (without removing any mechanical part of the terminal);
- it prevents movement of the card during the telephonic conversation, except at the exhaustion of the credit, since the card change must be allowed;
- it automatically detects possible external connections with the card, stopping their operations.

The terminal provided with the additional reader displays the residual credit of the prepaid card, in the following operative situations:

- when the terminal is in the stand-by condition, and the user acts on the keyboard in order to interrogate it;
- during a charged telephone call (performed from the terminal provided with the additional reader).

The additional reader of the terminal can perform also the following management procedures (besides the usual standard network procedures):

- validation of the chip card;
- decrease of the credit units from the chip card during the conversation;
- change of the chip card which is becoming exhausted.

Industrial Applicability

The practical realization of the invention, as explained until now at an illustrative level, must of course not

be interpreted in a limitative sense. Numerous and varied may be the configurations which, starting from the basic principle set forth in claim 1, employ an additional reader of prepaid chip cards in order to
5 provide an optimum functionality of the terminal where they are located.

An additional straightforward application may concern the public telephones network implemented on the ferry-boats, wherein the terminals are included in a network
10 with a centralized management and wherein the terminal operates after the insertion of a SIM card which allows the identification of the user.

Also with this kind of terminals connected in a network, the provision of a double reader for managing prepaid
15 chip cards results in an increase of the value of the services associated to the terminal itself.

Claims

1. Radio mobile terminal provided with an additional chip card reader, characterized in that it includes an additional reading device for managing chip cards of standard format, wherein said additional reading device
5 is a second reader having a standard format in the case of a GSM terminal, said reading device being suited to receive and to manage a prepaid chip card whereon the available credit used to benefit by the telephone service is stored, and in that said chip card embodies
10 the payment means for the radio mobile service.

2. Radio mobile terminal provided with an additional chip card reader according to claim 1, characterized in that in the terminals of the GSM type the additional
15 reader is also arranged to perform reading of SIM cards of the ID-1 format, with the following possible operative conditions of the two readers:

- if the SIM card is loaded in the ordinary reader and no card is inserted in the additional reader I-D1, the
20 terminal of the GSM type operates on the SIM card of the ordinary reader;
- if a SIM card is loaded in the ordinary reader and a second SIM card is loaded in the additional reader ID-1, the GSM terminal manages the SIM card of the additional
25 reader ID-1 only;
- if the SIM card is not loaded in the ordinary reader

and only the additional reader ID-1 is loaded the GSM terminal manages the SIM card of the additional reader ID-1;

- if a SIM card is loaded in the ordinary reader and in
- 5 the additional reader is loaded the prepaid card, the GSM terminal operates on the SIM Card of the ordinary reader; the payment is carried out by means of the prepaid card introduced into the additional reader.

INTERNATIONAL SEARCH REPORT

Application No

PC/IT 96/00151

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 H04M1/02 H04Q7/32 H04M17/00 H04M17/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB,A,2 269 512 (NOKIA MOBILE PHONES LIMITED) 9 February 1994 see the whole document ---	1,2
A	GB,A,2 267 794 (ALAN KILPATRIK CONROY) 15 December 1993 see abstract; figure 1 ---	1,2
A	PATENT ABSTRACTS OF JAPAN vol. 13, no. 175 (P-863), 25 April 1989 & JP,A,01 008492 (TOSHIBA CORP.), 12 January 1989, see abstract ---	1,2
A	WO,A,95 02949 (ADT ESPANA, S.L.) 26 January 1995 see abstract -----	1,2

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Information on patent family members

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